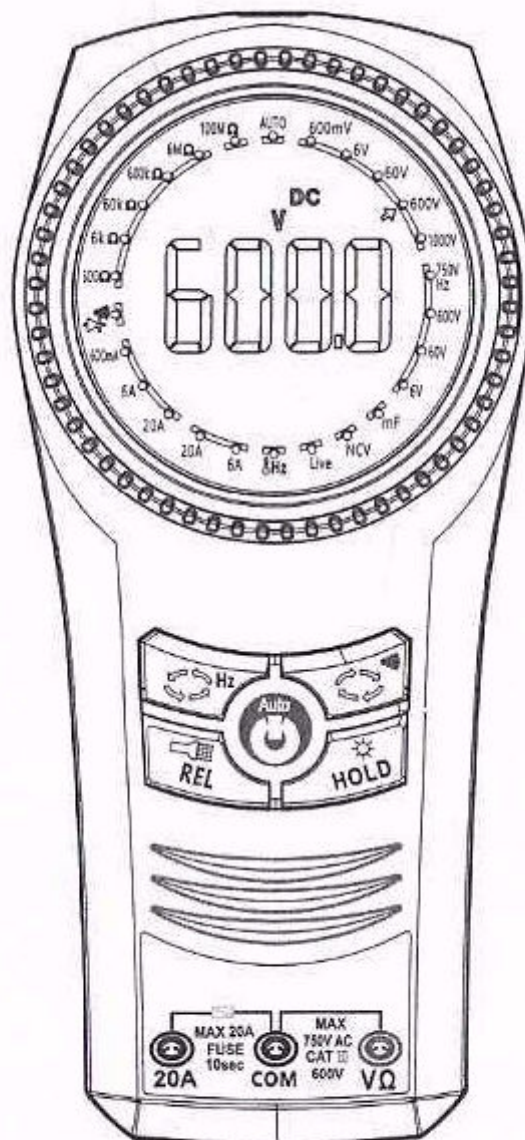


Smart Rotary Dial Multimeter Instruction Manual



Shenzhen Hanyan Electronic Technology Co., Ltd

- * Manufacturer reserves the right to change specifications without notice
- * Please read this manual carefully before using this product

一、 Overview

This series of multimeters are stable performance, ultra-bright color screen digital multimeter driven by battery, the multimeter uses all unit symbol, liquid crystal rotary dial; clear reading, adjustable backlight, displayed overload protection functions.



With liquid crystal instead of the traditional rotary dial, the rotary encoder easily adjust the measurement function of each file, the series of multimeters can be used to measure DC voltage and AC true RMS, DC current and AC current, resistance, capacitance, frequency, temperature, diode and continuity automatic identification test, smart voice report, frequency conversion measurement, high voltage diode output measurement. It provides a higher voltage of 1 voltage for diode measurement than traditional ones, making it more convenient for repair personnel to measure various LEDs. The tool is centered around a dual integral A/D converter and offers superior performance as a test instrument. It has been awarded the "China Electronic Product Excellence" title and is an ideal tool for laboratories, factories, radio hobbyists, and home use.


二、 Safety Precautions


This series of instruments is designed to comply with IEC1010 (International Electrotechnical Commission promulgated safety standards), before use, please read the safety precautions.

1. When measuring the voltage, please input the limit voltage of DC 1000V or AC 750V RMS.
2. The voltage below 36V is safe voltage. When measuring above 36V DC and 25V AC voltage, check whether test pen is reliable contact or right connected or good insulation properly, whether insulation is good and so on, in order to avoid electric shock.

3. When Change function and range, test pen should leave the test point;
4. Select the correct function and range, guard against accidental operation. the series of instruments although there is full-range protection, but for safety reasons, you still pay more attention.
5. When measuring current, do not input batteries more than 20A.
6. Safety Symbol Description :

"  " Exist dangerous voltage "  " Ground


"  " Double insulation

"  " Operator must refer to the instruction manual

"  " Low voltage symbol.

三、 Characteristics

1. General Characteristics

- 1-1. Display: High light color display;
- 1-2. Maximum display: 5999 (3 5/6) bits Automatic polarity display;
- 1-3. Measurement: double integral A / D conversion
- 1-4. Sampling rate: about 3 times per second;
- 1-5. Overrange display: the most significant bit was "0L";
- 1-6. Low voltage display: "  " symbol appears;
- 1-7. Working environment: (0 ~ 40) ° C, relative humidity <80%;
- 1-8. Power supply: 2*1.5V battery;
- 1-9. Volume (size): 153x70x33mm (LWH);
- 1-10. Weight: about 200g (including battery);
- 1-11. Attachment: a manual, a certificate, a box, a pair of pen, one Tp01 thermocouple (winApex189C/E only) 2*1.5V AA;
- 1-12. Executive standard GB/T 13978-2008

2. Technical characteristics

- 2-1. Accuracy (reading data of a%+ least significant digits),
guaranteed accuracy environment temperature: (23.5) °C,
Relative humidity <75%, calibration guarantee period from
the date of manufacture for one year.
- 2-2. Performance (Note "▲") Indicates that the instrument has this
function.

Types Functions	WinAPEX189D	WinAPEX189C	WinAPEX189S	WinAPEX189E
DC voltage DCV	▲	▲	▲	▲
AC voltage ACV	▲	▲	▲	▲
DC current DCA	▲	▲	▲	▲
AC current ACA	▲	▲	▲	▲
Resistance(O)	▲	▲	▲	▲
Diode/Continuity alarm	▲	▲	▲	▲
Capacitance (F)	▲	▲	▲	▲
Fahrenheit/Celsius °C / °F		▲		▲
Frequency (Hz)	▲	▲	▲	▲
Normal temperature display		▲		▲
Variable frequency measurement				▲
AUTO ON OFF	▲	▲	▲	▲
Backlight long opening/ brightness adjustable	▲	▲	▲	▲
NCV/Live	▲	▲	▲	▲
Flashlight lighting	▲	▲	▲	▲
Voice report			▲	
AUTO	▲	▲	▲	▲
Smart LCD rotary	▲	▲	▲	▲

2-3. Technical Specifications (Note "*" indicates that the multimeter does not have this range)

2-3-1. DC voltage(DCV)

Range \ Accuracy	WinApex189C/D/S	WinApex189E	Resolution
600mV	$\pm (0.5\% + 3)$	*	100uV
6V			1mV
60V			10mV
600V			100mV
1000V	$\pm (1.0\% + 10)$		1V

Input impedance:DC600mV, $1M\Omega$, Other ranges: $10M\Omega$

Overload protection: 200mV range is 250V DC or AC peak;
The rest are 1000V DC or 750V AC peaks.

2-3-2. AC voltage RMS (ACV)

Range \ Accuracy	WinApex189C/D/S/E	Resolution
6V	$\pm (0.8\% + 5)$	1mV
60V		10mV
600V	$\pm (1.2\% + 10)$	100mV
750V	$\pm (1.2\% + 10)$	1V

Overload protection: 600mV range is 250V DC or AC peak, the rest is 1000V DC or 750V AC peak; Turn the gear to "VFC" to enter the frequency conversion measurement, the maximum measurement value is AC750V, the frequency is 40Hz-200Hz (Only WinApex189E)

Frequency response:

True RMS measurable: sine wave and triangular wave frequency response: 40 Hz-1kHz; other waveform frequency response: 40Hz-200Hz

2-3-3. DC current

Range \ Accuracy	WinApex189C/D/S	WinApex189E	Resolution
600mA	$\pm (1.2\% + 8)$	*	100 μ A
6A			1mA
20A	$\pm (1.5\% + 10)$		10mA

The maximum measured pressure drop: 600mv ; Maximum input current: 20A (not exceeding 10 seconds)

Overload protection: 20A / 250V ceramic speed fuse.

2-3-4. ACcurrent (ACA) true RMS measurement

Range \ Accuracy	WinApex189C/D/S/E	Resolution
6A	$\pm (2.0\% + 5)$	1mA
20A	$\pm (2.0\% + 5)$	10mA

The maximum measured pressure drop: 600mv; Maximum input current: 20A (not exceeding 10 seconds)

Overload protection: 20A / 250V ceramic speed fuse

Frequency response: True RMS measurable: sine wave and triangular wave frequency response: 40 Hz-1kHz; other waveform frequency response: 40Hz-200Hz.

Display: true RMS.

2-3-5. Resistance (Ω)

Range \ Accuracy	WinApex189C/D/S/E	Resolution
600 Ω	$\pm (0.8\% + 5)$	0.1 Ω
6k Ω	$\pm (0.8\% + 3)$	1 Ω
60k Ω		10 Ω
600k Ω		100 Ω
6M Ω		1K Ω
100M Ω	$\pm (5.0\% + 30)$	10K Ω

Open circuit voltage: less than 3V; overload protection: 250V DC or AC peak; In the use of 600 Ω range, you should first short-circuit test leads, measured lead resistance, and then subtracted from the real measurement.

2-3-6. NCV/LIVE measurement:

When the gear is rotated to the NCA measurement function, the instrument is close to the electric field, and the buzzer will make different intermittent sounds according to the change of the intensity of the electric field, and the red alarm light will blink at the same time. When the gear is rotated to the LIVE fireline measurement, insert a red watch pen into the V Ω hole, and the nib is in close contact with the measured fireline, the buzzer will make continuous sound, and the red alarm light will blink.

2-3-7. Capacitance

Range \ Accuracy	WinApex189C/D/S/E	Resolution
60nF	$\pm (3.5\% + 20)$	10pF
600nF		100pF
6uF		1nF
60uF		10nF
600uF		100nF
6mF		1uF
60mF	$\pm (5.0\% + 10)$	10uF

Overload protection: 250V DC or AC peak

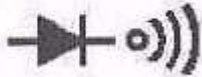
2-3-8 Temperature (T)

Range \ Accuracy	WinApex189C/E	Resolution
(-20~1000) °C	$\pm (1.0\% + 5) < 400^{\circ}\text{C}$ $\pm (1.5\% + 15) \geq 400^{\circ}\text{C}$	1°C
(0 ~1832) °F	$\pm (0.75\% + 5) < 750^{\circ}\text{F}$ $\pm (1.5\% + 15) \geq 750^{\circ}\text{F}$	1°F

Temperature probe: TP01 K type thermocouple(banana plug).

Overload protection: 250V DC or AC peak (no more than 15 seconds).

2-3-9. Diode and Continuity Test

Range	Display value	Test Conditions
	Diode forward voltage drop	Base current is about 10uA, Vce is about 3V
	The buzzer long sounds Test the resistance of two points less than (50 20) Ω	Open circuit voltage about 4.2V

When starting up normally, it is automatically measured when measuring between the diode and buzzer. When the resistance is below 50 Ω , it is measured by the buzzer. When the measured resistance value is more than 50 Ω , it is automatically converted to diode measurement; Press the select key to switch to manual measurement.

Overload protection: 250V DC or AC peak

Warm: for safety, within this range, it is prohibited to input the voltage value.

2-3-10 Frequency (Hz)

Range	Accuracy	WinApex189C/D/S/E	Resolution
6Hz	$\pm (0.1\% + 3)$		0.001Hz
60Hz			0.01Hz
600Hz			0.1Hz
6kHz			1Hz
60kHz			10Hz
600kHz			100Hz
6MHz			1kHz
10MHz			10kHz

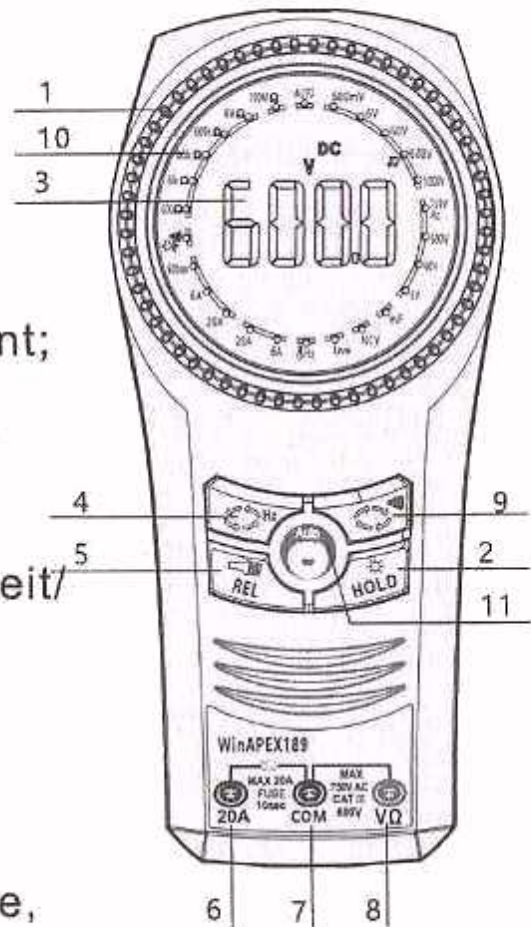
Input sensitivity: 1V RMS; overload protection: 250V DC or AC peak (not more than 10 seconds).

If you measure the electrical frequency, switch to AC750V and hold down the counterclockwise rotation key.

四、 Use Method

(一) Operation panel instructions (see Figure1)

1. The rotary dial gear rotates clockwise or counterclockwise to adjust the desired measurement function while the LCD arrow points to the current measurement function.
2. Short trigger data latch key; HOLD for 2 seconds to adjust the brightness of the backlight, the default brightness of the power on is 60%, every time the hold is triggered, the cycle adjustment is between 60%-80%-100%-0%-20%-40%, hold for more than 2 seconds to exit the backlight brightness adjustment.
3. Liquid crystal digital display
4. The short trigger is the LCD display function, rotate and select the measurement function every time the reverse is triggered, long press the key in the AC750V gear to the mains frequency of 220V and 380V, and other functions outside the AC750V gear trigger the key to cancel the resistance, capacitance and diode protection measurement;
5. Relative value measurement key, long press to turn on and off the flashlight; Temperature measurement is Celsius/Fahrenheit/frequency switch key;
6. 20A current test socket;
7. Temperature, “_” public space;
8. Voltage, resistance, diode, capacitor, frequency, temperature, “+” pole socket;



(Figure1)

9. Short trigger for LCD function, each trigger a simultaneous rotation selection measurement function, long press the key to cancel the buzzer when the rotary dial rotates;
10. LCD function prompts;

(二) Voltage measurement

1. Insert the black test lead into the "COM" socket. The red test pen into the "V / Ω / Hz" jack;
2. Rotate the gear ring to the "DCV" range, if the measured voltage is unknown, the maximum range should be selected, and then gradually reduce until the highest resolution reading is obtained;
3. The test pen to reliably touch the test point, the screen shows the measured voltage value, display the DC voltage measured, the red pen is connected to the point of the polarity of the voltage.

Note:

1. "OL" is displayed, it indicates that the range has been exceeded and the range switch must be turned to a higher gear;
2. The measured voltage should not exceed 1000V DC and 750V AC, and the probe should be away from the test point when switching functions and ranges;
3. When measuring high voltage circuit, pay special attention to avoid electric shock.

(三) Current measurement

1. Insert the black test lead into the "COM" socket, insert the red test lead into the "20A" ;
2. Rotate the gear ring to DC or AC/20A, if the measured current is unknown, select the maximum range and gradually decrease it until the highest resolution reading is obtained;

3. Connect the probes of the multimeter in series to the tested circuit, and the screen will display the measured current value; When measuring the DC current display, the current and polarity at the point connected to the red probe.

Note:

1. If "OL" is displayed that has exceeded the range, needed to turn the range switch to the appropriate gear ;
2. When measuring current, the "mA" gear should not exceed 600mA, and the "20A" gear should not exceed 20A (test time less than 10 seconds). When switching functions and ranges, the probes should leave the test point.

(四) Resistance Measurement

1. Insert the black test pen into the "COM" socket while the red test pen leads into the "V / Ω / " jack;
2. Rotate the gear ring to the corresponding resistance range, and connect the two markers to the measured resistance.

Note:

1. If the resistance value exceeds the selected range value, it will show "OL ", then the switch should be turned up one gear;
2. When the input terminal is circuit, it displays an overload situation;
3. When measuring online resistance, it is necessary to confirm that all power sources of the tested circuit have been turned off and all capacitors have been completely discharged before proceeding;
4. Do not enter the voltage in the resistance range;
5. When the measured resistance value exceeds 1M Ω , it takes several seconds for the reading to stabilize, which is normal when measuring high resistance.


(五) Capacitance Measurement

1. Insert the black test pen leads into the "COM" socket while the red test pen leads into the "V / Ω / Hz" jack;
2. Rotate the gear ring to the capacitance range and connect the two markers to the measured resistance.

Note:

1. If the measured resistance exceeds the selected range, the display will only show "OL";
2. Before testing the capacitor, there may still be residual readings on the screen, which is a normal phenomenon and will not affect the measurement results;
3. When large capacitance stalls is measuring serious leakage or breakdown capacitor, it will show some unstable values.
4. Please test the capacitor capacity before the capacitor should be fully discharged to prevent damage to the fuse and instrumentation;
5. It is strictly prohibited to input voltage in this range;
6. This capacitance range is for automatic range testing, with a measurement range from 10nF to 60mF;
7. Unit: 1mF=1000uF 1uF=1000nF 1nF=1000pF

(六) Temperature measurement

Rotate the gear ring to the " " range, the initial measurement is $^{\circ}\text{C}$, press "REL" to convert To lower $^{\circ}\text{F}$, the cold (free) negative electrode (black plug) of the thermocouple sensor is inserted into the "COM" jack, the positive electrode (red plug) is inserted into the V/Q jack, and the working end (temperature measuring end) of the thermocouple is placed above or inside the object to be measured to read the temperature value directly from the display in degrees Celsius or Fahrenheit (WinApex189C/E).

Note:

1. When the input terminal is open, the ambient temperature is displayed when the operating environment is higher than 18°C and lower than 28°C . When the operating environment is lower than 18°C and higher than 28°C , the ambient temperature is displayed for reference only.
2. Do not replace the temperature sensor at will, otherwise the measurement accuracy cannot be guaranteed;
3. Do not input voltage in the temperature range.


(七) Frequency Measurement

1. Connect the marker or shielded cable to the COM and V/ Ω input terminals;
2. Rotate the gear ring to the frequency, and connect the marker or shielded cable to the signal source or the measured load.

Note:


3. Dial and rotate to AC750V; Long press the key 4(000000) to test the mains frequency of AC220V and AC380V.
4. This frequency gear is an automatic range test, which can measure up to 1kHz.

(八) Diodes and on-off test

1. Insert the black test lead into the "COM" socket while the red test lead into the "V / Ω /" jack (note the polarity of the red test pen is "+");
2. Rotate the gear ring to " gear for automatic identification of the diode/buzzer, and connect the pen To the diode to be tested, the red pen is connected to the positive electrode of the diode, the black pen is connected to the negative electrode of the diode, and the reading is an approximation of the forward voltage drop of the diode;

3. Connect the probe to two points on the circuit to be tested, If the built-in buzzer sounds and the on-off alarm indicator is on, the resistance between the two points is below $(50 \pm 20) \Omega$.

(九) Keep data

Pressing "HOLD"  will display the "HOLD" symbol on the screen, and the current data will remain on the screen. Pressing this button again will cause the "HOLD" symbol to disappear and resume measurement;


(十) Automatic shutdown

When the instrument stops using for about 15 minutes, the meter will automatically power off to enter the sleep state;

(十一) Power on and off

Long press the key to open and close the voltage, hold down the clockwise key, counterclockwise key, power key; Three keys at the same time can cancel the automatic shutdown; There is no APo symbol on the LCD screen.


(十二) Backlight display

Long press "  " button for 2 seconds, and beep, enter the backlight can be adjusted, each adjustment to 20%, the default value is 60%, cycle in turn;

五、 Instrument maintenance


The series of instruments is a accurate instrument, the user should not arbitrarily change the circuit.

1. Please pay attention to waterproof, dustproof and fall prevention
2. Should not be in the high temperature and high humidity flammable and explosive environments and strong magnetic field to store and use the instrument;

3. Please use a wet cloth and mild detergent to clean the appearance of the instrument, do not use abrasive or other strong solvents like alcohol and so on;
4. If you do not use for a long time, you should remove the battery to prevent leakage of the battery corrosion instrument;
- 4-1. Note the battery usage, when the screen shows the "  " symbol, you should replace the battery, the steps are as follows:
 - 4-1-1 Unscrew the screws that fixed the battery cover and eject ;
 - 4-1-2 Remove the battery and replace it with a new one. Although any standard battery can be used, it is best to use alkaline batteries for extended use.
 - 4-1-3 Attach the battery cover and tighten the screws.
- 4-2 Fuse Replacement

When replacing the fuse, use the same type of fuse.

六、 Troubleshooting

Failure phenomenon	Check the location and methods
Not shown	<ul style="list-style-type: none"> ■ Battery not connected; ■ Keep the switch on; ■ Replace the battery.
 Symbol exit	<ul style="list-style-type: none"> ■ Replace the battery.
Current is not input	<ul style="list-style-type: none"> ■ Replace fuse
Display error	<ul style="list-style-type: none"> ■ Replace the battery.

Once this manual is being changed without notice;

These contents of this manual included are considered to be correct, if the user found errors, omissions, etc., please contact the manufacturer directly;

The company does not undertake due to user error operation and the harm caused by the accident;

The functions described in this manual are not intended to reasons of the product for special purposes.

